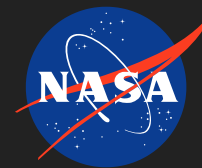


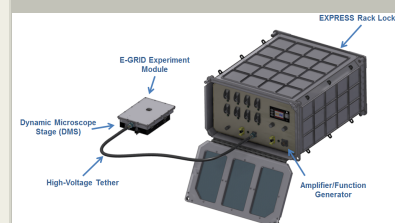
Electrical Microgravity Research in Colloidal Development Platform, Phase I

Completed Technology Project (2015 - 2015)



Project Introduction

The proposed innovation is a platform upon which to perform high voltage Electrical microGravity Research In colloidal Development (E-GRID). This platform will facilitate safe experimentation in space with colloidal samples at high voltages. E-GRID will be comprised of three components: the experiment module, which houses the colloidal sample and electrodes; the high voltage safety tether, which provides three levels of safety interlocks; and the high voltage amplifier/function generator. Techshot has been involved in the development of numerous Advanced Colloidal Experiment modules designed to perform mixing and temperature control tasks. In the development of these modules, discussions with researchers revealed a common need: a high voltage source and platform to perform colloid assembly and dielectrophoresis experiments. The majority of experimentation has been performed in ground based laboratories, with the exception of a few microgravity experiments aboard parabolic-flight vehicles. This has substantially limited achievable science. E-GRID is a direct response to this need. To perform these experiments, a high voltage amplifier and function generator capable of producing sinusoids and square waves with amplitudes as high as 10kV and frequencies ranging between DC and 100kHz are required. Achieving this in space is a substantial engineering task. Fortunately, Techshot has exceptional experience with high voltage safety, which can be applied to this project. Our Bone Densitometer safely operates aboard ISS using an 80kV Crockcroft-Walton Generator. We propose to space-qualify a commercial off-the-shelf amplifier/generator and pair it with a previously-developed Techshot experiment module. The experiment module is designed to work with the Techshot Dynamic Microscope Stage, which provides power, illumination, and communication to the experiment module when it is installed in Techshot's Mic-E (Microscope-EXPRESS) or the Light Microscopy Module.



Electrical Microgravity Research in Colloidal Development Platform, Phase I

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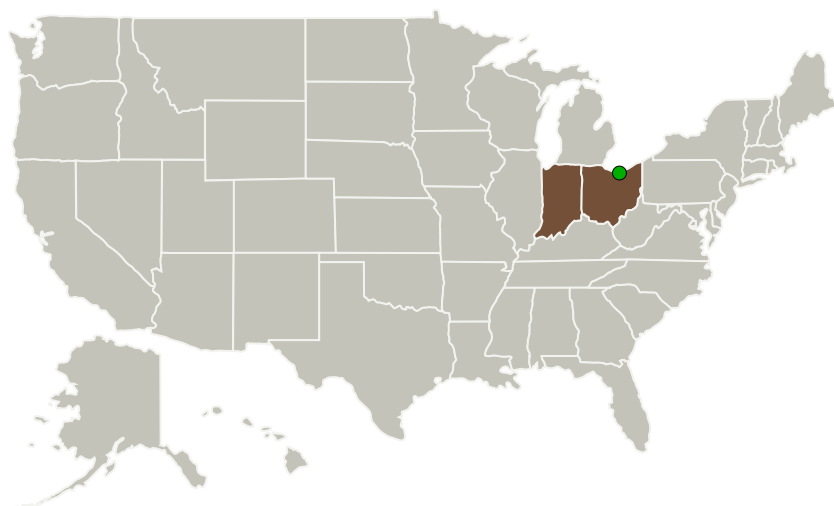
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Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
Techshot, Inc.	Lead Organization	Industry	Greenville, Indiana
● Glenn Research Center(GRC)	Supporting Organization	NASA Center	Cleveland, Ohio

Primary U.S. Work Locations

Indiana	Ohio
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Project Transitions

▶ **June 2015:** Project Start

✓ **December 2015:** Closed out

Closeout Summary: Electrical Microgravity Research in Colloidal Development Platform, Phase I Project Image

Closeout Documentation:

- Final Summary Chart Image(<https://techport.nasa.gov/file/138964>)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Techshot, Inc.

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

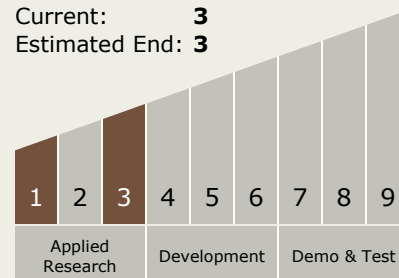
Carlos Torrez

Principal Investigator:

Michael Kurk

Technology Maturity (TRL)

Start: **1**
Current: **3**
Estimated End: **3**

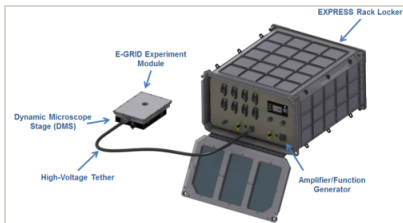


Electrical Microgravity Research in Colloidal Development Platform, Phase I

Completed Technology Project (2015 - 2015)



Images



Briefing Chart Image

Electrical Microgravity Research in Colloidal Development Platform, Phase I

(<https://techport.nasa.gov/image/135913>)

Technology Areas

Primary:

- TX12 Materials, Structures, Mechanical Systems, and Manufacturing
 - └ TX12.4 Manufacturing
 - └ TX12.4.1 Manufacturing Processes

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System